CLAIMS:

1. A hydraulic system for supporting a body organ, the system comprising a closed loop liquid-tight tubing fitted with a pressure generator for propelling a liquid through the system, an organ engaging member connected to a pressure chamber via a discharge valve for controlled discharge of liquid into the organ inflatable pressure member; said organ engaging member comprising an inflatable pressure member suited for receiving the organ; at least one control valve for selectively controlling liquid flow through the system; and a controller for selectively controlling the discharge valve and the at least one control valve.

2. A system according to claim 1, wherein the organ engaging member comprises a rigid housing accommodating the inflatable pressure member, where the organ is received within a space formed by the inflatable member and whereby inflating the inflatable member entails constriction of the space.

3. A system according to claim 2, wherein the inflatable member is annular.

4. A system according to claim 1, wherein the liquid flowing through the system is a physiological acceptable solution.

5. A system according to claim 1, wherein the pressure chamber is a pressure accumulator.

6. A system according to claim 1, wherein the pressure chamber comprises an accumulator fitted with an elastic membrane.

7. A system according to claim 1, wherein the pressure discharge valve and control valves are one-way valves.

8. A system according to claim 1, wherein the controller is programmable.

9. A system according to claim 1, wherein the controller generates control signals responsive to signals corresponding with physiologically-related parameters obtained from the body.

10. A system according to claim 1, being a cardiac assist device and where the organ engaging member is fitted around the heart.

11. A system according to claim 10, wherein the controller generates control signals responsive to heart condition signals received from an associated ECG device.

12. A system according to claim 10, wherein the wherein the discharge valve is activated to exercise the organ engaging member at a rate corresponding with the self systolic pace of the heart.

13. A system according to claim 1, wherein the where the organ is a limb and where the system is used for messaging the limb and stimulating blood flow there through.

14. A system according to claim 1, wherein the used as a peristaltic assist device.

15. A system according to claim 1, wherein the where the pressure generator is a hydraulic pump.

16. A system according to claim 15, wherein the where the pump is a low flow-rate pump.

17. A system according to claim 16, wherein the pump continuously operates.

18. A system according to claim 1, wherein the organ engaging member is inflated to an extent below its elastic deformation.

19. A system according to claim 1, wherein the closed loop liquid-tight tubing comprises non-elastic components.

20. A system according to claim 1, wherein a first one-way valve is fitted between the pressure generator and the pressure chamber

21. A system according to claim 20 wherein a second one-way valve fitted between the organ engaging member and the pressure generator.

22. A system according to claim 21, further comprising a circulation one-way valve mounted in parallel relation to the pressure generator, on a tube segment extending between the pressure generator and the first one-way valve, and between the second one-way valve and the pressure generator.

23. A body-organ hydraulic assist system comprising a pressure generator for propelling a liquid through the system, a pressure chamber, an organ engaging

member connected to the pressure chamber and fitted with an inflatable pressure member, valve means for selectively controlling liquid flow through the system and for controlled discharge of liquid to the organ engaging member; a controller for selectively controlling the valve means.

24. A system comprising according to claim 1, comprising two or more organ engaging members, associated with corresponding pressure chambers with respective valves, and at least one pressure generator for propelling a liquid through the system; said controller discreetly controlling the system so as to obtain a sequential performance of the organ engaging members, in a peristaltic manner.

25. A hydraulic assist system for stimulating motion to a body organ, the system comprising a primary pipe circuit being in flow communication with a secondary pipe circuit; said primary pipe circuit comprising an organ engaging member fitted with a hydraulically inflatable pressure member adapted for receiving said organ, a pressure chamber coupled to a pressure generator via a pressure discharge valve; the system further comprising control valves for selectively circulating liquid through the primary pipe circuit or through the secondary pipe circuit, and a controller for controlling said discharge valve and said valves.

26. A system according to claim 25, wherein the primary pipe circuit comprises a first one-way valve fitted between the pressure generator and the pressure chamber, a second one-way valve fitted between the organ engaging member and the pressure generator.

27. A system according to claim 26, wherein the secondary pipe circuit comprises a circulation one-way valve mounted in parallel relation to the pressure generator, on a pipe segment extending between the pressure generator and the first one-way valve, and between the second one-way valve and the pressure generator.

28. A method for stimulating motion to a body organ, the method comprising the following steps:

(a) obtaining body-organ hydraulic assist system comprising a pressure generator for propelling a liquid through the system, a pressure chamber,

an organ engaging member connected to the pressure chamber and fitted with an inflatable pressure member, valves for selectively controlling liquid flow through the system and for controlled discharge of liquid to the organ engaging member; a controller for selectively controlling the valve means;

(b) fitting the inflatable pressure member over the limb;

(c) activating the pressure generator and the controller.

29. A method according to claim 28 for assisting a failing ventricular system, the method further comprising the steps of:

(d) obtaining condition signals indicative to a heart condition, obtained from an associated ECG device;

(e) said controller generating control signals to the valves of the system, responsive to said condition signals.

30. A method according to claim 29, wherein the controller generates the control signals in cadence with the normal functioning of the heart.

31. A method according to claim 29, wherein the pressure chamber is charged with liquid during the diastolic heart period.

32. A method according to claim 28, wherein the hydraulic assist system comprises a first one-way valve fitted between the pressure generator and the pressure chamber, a second one-way valve fitted between the organ engaging member and the pressure generator, a pressure discharge valve for controlled discharge of liquid from the pressure chamber into the organ engaging member, and a circulation one-way valve mounted in parallel relation to the pressure generator, on a tube segment extending between the pressure generator and the first one-way valve, and between the second one-way valve and the pressure generator.

33. A method according to claim 32 comprising two principal control stages;

I. a charging stage wherein the pressure discharge valve and the circulating valve are closed, the first valve and the second valve are open, and the pressure generator is active; and

II. a pressure stage wherein the discharge valve is open to thereby facilitate inflating the pressure member, and the circulating valve is open where the pressure generator is active; whilst the first valve and the second valve are closed.

34. A method according to claim 32, comprising the following steps:

(a) closing the pressure discharge valve and the circulating valve;

(b) opening the second valve so as to drain the organ engaging member;

(c) opening the first valve and charging the pressure chamber;

(d) closing the first valve and the second valve and simultaneously opening the circulation valve;

(e) controllably opening the pressure discharge valve so as to inflate the pressure member;

(f) repeating steps (a) to (e).

35. A method according to claim 34, wherein the system is used as a ventricular assist device, wherein step (e) is carried out at the beginning of a systolic heart period.

36. A method according to claim 34, wherein steps (c-d) take place during the diastolic heart period.

37. A method according to claim 34, wherein the operational steps take place in cadence with the normal functioning of the heart.

38. A method according to claim 34, wherein the pressure generator continuously operates.

39. A method according to claim 28, wherein the hydraulic assist system comprises a first one-way valve fitted between the pressure generator and the pressure chamber, a second one-way valve fitted between the organ engaging member and the pressure generator, a pressure discharge valve for controlled discharge of liquid from the pressure chamber into the organ engaging member, and a circulation one-way valve mounted in parallel relation to the pressure generator, on a tube segment extending between the pressure generator and the first one-way

valve, and between the second one-way valve and the pressure generator; the method comprises the following control steps:

(a) after charging the pressure chamber, closing the first valve, the second valve, and opening the circulating valve;

(b) opening the discharge valve to pressurize the wherein the hydraulic assist system comprises a first one-way valve fitted between the pressure generator and the pressure chamber, a second one-way valve fitted between the organ engaging member and the pressure generator, a pressure discharge valve for controlled discharge of liquid from the pressure chamber into the organ engaging member, and a circulation one-way valve mounted in parallel relation to the pressure generator, on a tube segment extending between the pressure generator and the first one-way valve, and between the second one-way valve and the pressure generator; the method comprises the following control steps;

(c) closing the discharge valve;

(d) opening the second valve to discharge the inflatable pressure member;

(e) opening the first valve and closing the circulating valve; and

(f) repeating steps (a) to (e).

40. A method according to claim 39, wherein the pressure generator continuously operates.